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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE • MARCH 30, 1946



Television From The Sky

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A SCIENCE SERVICE PUBLICATION

MEDICINE

New Antiseptic Solution

Acts through hydrogen peroxide. Used for wounds and ear, nose, throat and lung infections; tried in over 800 patients.

► A NEW TYPE of antiseptic solution for use in wounds and in eye, ear, mouth, throat, lung and skin infections is reported in the *Annals of Allergy*, (Jan.-Feb.), official publication of the American College of Allergists, Dr. Fred W. Wittich, secretary-treasurer of the college, announces.

The new antiseptic, called thenardol, was developed by Dr. Ethan Allan Brown of Boston and his colleagues. The antiseptic effect of thenardol is due to hydrogen peroxide, the household first aid for cuts of a generation or two ago.

In theory, it is explained, hydrogen peroxide is the safest antiseptic substance available since its end-products, water and oxygen, are non-poisonous and non-irritating, and do not cause allergic reactions. It is relatively non-selective bacterially, that is, it acts on all kinds of germs, and is also deodorizing, cleansing and will stop bleeding.

Hydrogen peroxide, however, does not stand up well in storage and its action when in contact with wound surfaces is transient. Dr. Brown and his collaborators overcame these disadvantages by using urea peroxide as a source of hydrogen peroxide. Dissolving urea peroxide in anhydrous glycerol gave them a stable solution for storage purposes as well as a new type of antiseptic for use on wounds or infected skin and the like.

The solution can also be used as an aerosol, or mist, in contact with tissue fluids. This makes possible its use by inhalation for lung infections.

The first patients on whom it was used were either sensitive to sulfa drugs or penicillin or suffered from mixed bacterial infections resistant to either type of medication. Especially gratifying were the results in middle ear infections, mouth infections, and empyema.

Thenardol was named for Louis Jacques Thenard, the French scientist who discovered hydrogen peroxide.

Its action is explained as follows: The urea peroxide decomposes into urea and hydrogen peroxide. Tissue peroxidase, an enzyme in the body, then acts upon the hydrogen peroxide to form water and oxygen. The oxygen, trapped by the glycerol, churns it continuously, renewing the interface between the antiseptic and the wound surface and forming an oxygenated cream. The remaining urea, itself germ-stopping, peptises dead tissue and hastens wound healing. Oxine, the secondary stabilizer, is also germ-checking. The glycerol, which does not dry, is viscous and remains where placed. It is hygroscopic, so that it draws plasma from the deeper parts of wounds, not only washing out bacteria but diluting toxins and irritants.

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AERONAUTICS

Largest Wind Tunnel

Will test steel models of guided missiles and jet and rocket aircraft at twice the velocity of sound. Is in use at Moffett Field, Calif.

► A 1500-MILE-AN-HOUR wind tunnel, the largest in the United States, designed to conduct tests upon models of guided missiles and jet- and rocket-propelled aircraft, is now in use in the Ames Laboratory of the National Advisory Committee for Aeronautics at Moffett Field, Calif. The new supersonic wind tunnel is designed to operate exclusively above the present limit of human flight imposed by the same phenomenon, the

velocity of sound, which is approximately 760 miles an hour.

The tunnel will be used to conduct fundamental research to obtain knowledge of the design requirements for stable and controllable flight at the tremendous speeds made possible by recently perfected systems of propulsion.

Steel models will be used in the tests. They will be accurately made, and will be mounted in the three-square-foot test

section of the supersonic tunnel. Air is forced through this restricted channel at velocities as high as twice the speed of sound, simulating the conditions encountered by a supersonic aircraft. Power is supplied by electric motors totaling 10,000 horsepower, driving four three-stage centrifugal compressors which rotate at a constant speed of 5,350 revolutions per minute.

Variation of the scale of flight is achieved by changing the pressure inside the tunnel from a near-vacuum up to almost three times atmospheric pressure. Sensitive regulators maintain the pressure automatically. Humidity in the tunnel is accurately controlled by means of air-driers, which can reduce the moisture content inside the tunnel to as little as 1% of that of normal atmosphere.

Another supersonic tunnel, now nearing completion at the same laboratory, will extend the available range of supersonic testing speeds to an extreme of 3.6 times that of sound for short periods of time, NACA officials announce. This means a velocity of more than 2,600 miles an hour. It will have a test section identical with the electrically-driven tunnel to permit interchange of models, but it will operate intermittently from a huge pressure tank. All observations will have to be made within about 10 minutes, in which time the entire supply of high-pressure dry air is exhausted.

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ORDNANCE

Japs Copied Garand Rifle; Failed to Manufacture

► THE GARAND RIFLE received the sincerest of flattery—imitation—from the notoriously copy-minded Japs, it is disclosed in *Army Ordnance* (Mar.-April). A semi-automatic weapon that was an almost exact copy of the American firearm was developed during the closing days of the war, but lack of material and industrial disorganization prevented quantity production.

An American war materiel recovery team found 100 of the rifles in the Washimo Seiki Sawania factory, in the Nagoya area.

The Japanese version of the M-1 differs chiefly in its lighter weight, due mainly to the use of a different kind of wood in the stock, and in having a caliber of .303 instead of .30 inch, to take the standard Japanese 7.7-millimeter cartridge. The rear sight also is different, and the magazine holds only five rounds instead of eight.

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ELECTRONICS

Airborne Television

It gave the Army and Navy "eyes" in remote-controlled aircraft during the war and now promises revolutionary peacetime developments.

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► NOW IT IS "walkie-lookie". Airborne television, that gave the Army and Navy "eyes" in remote-controlled aircraft and other important weapons for victory, was demonstrated to the public with a promise of many revolutionary developments from the use of television in peacetime airplanes.

Two systems of aerial television, known during the war as "block" and "ring," were shown to the press at the Naval Air Station at Anacostia, D. C., by Navy and Radio Corporation of America engineers who worked on the projects. The official U. S. Navy photograph on the cover of this SCIENCE NEWS LETTER shows the way a moored blimp looked at a "ring" television receiving station eight miles away from the plane at the time of the transmission.

"Ring" equipment transmits clear television pictures from up to 200 miles, while a more compact unit, the "block" system, is a smaller installation for use over shorter distances.

"Walkie-lookie," the picture equivalent of the small remote voice instrument known as "walkie-talkie," will come from the "block" system's light-weight, easily portable television camera, according to Brig. Gen. David Sarnoff, president of RCA. He predicted literal eyewitness news coverage for events in the future with the small camera.

Other predicted peacetime developments from the war's airborne television equipment include:

1. Television test pilots in experimental aircraft to eliminate the risk of life. Airborne systems could not only transmit views of the plane's surroundings, but also give controllers on the ground a continuous picture of the plane's instruments.

2. Sight transmission of weather and traffic conditions to air pilots and marine navigators.

3. Television eyes for industry and science that will present pictures of operations or experiments to distant observers. Thus, dangerous work such as that involved in many phases of atomic energy investigation might be seen "close

up" by observers at a safe distance.

4. Airborne exploration of hazardous regions with remote-controlled aircraft using television.

5. Numerous commercial applications such as the use of television to provide visual stimulus to travel enterprises.

In the war, the Army and Navy used "block" and "ring" for many important life-saving duties. These television systems were used to guide both pilotless aircraft and surface boats, and explosive-laden bombers and crash boats could be sent against the enemy for "direct hits" accurately controlled by distant operators.

Television, the Navy revealed, guided free-falling, radio-controlled aerial bombs, flying torpedoes, assault drones and pilotless explosive gliders.

Eyewitness views of many hazardous positions came to remote headquarters

through television cameras in important operations, Navy experts reported. In amphibious landings, reconnaissance and gunfire were reported vividly from the spot of action by television, while observation planes for artillery spotting, gun control, map making and other important jobs used "block" or "ring" cameras.

Visual word messages, maps and charts were sent at high speed between ships and aircraft and from one part of a ship to another during battle by Navy television installations, it was explained.

The Army and Navy used visual cameras to record tests of equipment that required perilous conditions of experiment.

Both the Army and Navy used the "block" system during the war, while the long-range "ring" television equipment was produced in the latter stages of the conflict.

The names "block" and "ring" were used as code names to protect the projects, and the first work on airborne television was done under the unrevealing title "Jeepette." "Block" used on Navy gliders became "Glomb" and on over-age bombers used to fly remote control missions was called "War Weary." Navy



WASP ENGINE PROTECTED—Dr. Henry Butler Allen, secretary and director of the Franklin Institute, explains the protective refinishing of the Wasp No. 1 engine to Lieut. Gen. Hoyt S. Vandenberg. Through the moisture-proof wrapping of pliofilm can be seen the numerous bags of protek-sorb silica gel and (lower center) a humidity indicator.

crash boats with television eyes were designated as "Campbells," while the television system for guided bombs was "Roc."

Important future military uses of the new equipment include a combined photo-television communication system. Transmitting 100 words in less than one second, this communication operation would give almost instantaneous copies of television messages by automatic photographing. Photographs or charts could be sent in the same way. This system

could be used up to 20 miles, the Navy said.

In naval operations, pilots on several aircraft carriers could be briefed for missions from one control room, while oral instructions and orders that might be confused in noisy locations can be clearly understood using a television screen.

Future marine surveys, observations of fish life and salvage operations will probably use television equipment, the Navy revealed.

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sizes and shapes of their molecules can be determined, and plans can be made for the construction of even longer, curlier and better synthetic molecules.

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Crisp light-brown *salted wafers* with a slight cheese and toasted potato flavor may be made from potatoes and skim milk, following a simple method developed by government dairy experts.

"Ladybug prospectors" hunt hidden hordes of hibernating ladybugs for shipment to orchard and garden regions where they are released to feed on such agricultural pests as aphids, red spiders and potato beetle eggs.

ENTOMOLOGY

Insect Fifth Columnists

The female ichneumon fly lays her eggs in the larvae of other insects, and the grubs devour the vitals of their living prey.

► FIFTH columnists of the insect world, that attack other insects by very literal boring-from-within tactics, were described before a special meeting of the Washington Academy of Sciences by Dr. Henry K. Townes of the U. S. Department of Agriculture. At the meeting, the Academy's Awards for Scientific Achievement were presented to Dr. Townes, Dr. Robert Simha of the National Bureau of Standards and Kenneth L. Sherman of the Carnegie Institution of Washington.

The insect allies of the human race studied by Dr. Townes are known as ichneumon flies, though they are more nearly related to wasps than to flies. They are rather small, few of them being more than half an inch long, but their attack on other insects is deadly. The female lays her eggs in the eggs or larvae of other insects, and when the grubs hatch out they devour the vitals of their living prey. A few species prey on spiders—a case of man-bites-dog in the insect world.

Dr. Townes made a new classification of all forms of ichneumon flies known in the United States and Canada. He estimates that in this area there are some 8,000 or 10,000 species in the group, of which only about 2,500 have thus far been named.

Air Electricity

► THERE'S electricity in the air, even when lightning is not flashing, Mr. Sherman told his listeners. A current of something like 2,000 amperes is continuously flowing into the earth, and nobody has yet found an explanation for it.

At the Carnegie Institution's Terrestrial Magnetism Laboratory, Mr. Sherman and his colleagues work constantly at measuring this fair-weather atmospheric electricity, and at developing better methods and improved apparatus for the work. Some of the instruments are of almost incredible delicacy: a vital part may consist of a fiber of spun fused quartz, finer than a cobweb thread yet thinly coated with metal. They are of corresponding sensitiveness; the speaker stated that "as many unit charges flow through an ordinary light bulb in one second as we would accumulate in our conductivity apparatus in 100,000 years."

Molecules in Plastics

► THE STRENGTH and elasticity of synthetic plastics like GR-S rubber and nylon depend on the size and shape of the molecules, Dr. Simha stated. Molecules of these substances are huge, with molecular weights in the tens or hundreds of thousands, as compared with molecular weights in mere tens or hundreds for such simple substances as water and alcohol. These molecules are long and narrow, and normally coil like snakes, which is what gives them their high degree of "stretch and spring."

Since even these big molecules cannot be observed directly, their properties have to be determined by what they do. They are permitted to diffuse through and settle down in liquid media, and the rates measured. They are stirred with instruments that measure their resistance to stirring. In these and other ways the

SCIENCE NEWS LETTER

Vol. 49 MARCH 30, 1946 No. 13

The weekly summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N. St. N. W., Washington 6, D. C. North 2255. Edited by WATSON DAVIS.

Subscriptions—\$5.00 a year; two years, \$8.00; 15 cents a copy. Back numbers more than six months old, if still available, 25 cents.

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Entered as second class matter at the post office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and the Engineering Index.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N.Y.C., Pennsylvania 6-5566 and 360 N. Michigan Ave., Chicago, STAt 4439.

SCIENCE SERVICE

The Institution for the Popularization of Science organized 1921 as a non-profit corporation.

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METALLURGY

Metallic Titanium Uses

May become as widely used as aluminum and magnesium because it is possible to extract a relatively pure ductile titanium from its natural ores.

► **METALLIC TITANIUM**, a strong light metal, may become perhaps as widely known and used as aluminum and magnesium because of methods perfected by the U. S. Bureau of Mines, making possible the extraction of a relatively pure ductile titanium from its natural ores.

The process can be expanded and used on a large scale, Bureau officials state. Titanium ranks fourth in abundance among metallic elements suitable for engineering purposes.

Titanium has long been known and used; not, however, as a metal but in its compounds. Titanium dioxide, the mineral rutile, is used in large quantities as a pigment in paint because of its great whitening power. It is also used in rubber, linoleum, leather, plastics, soap, printing inks, paper, textiles, and ceramics. Certain alloys are also of importance, particularly ferro-carbon-titanium, which is used in the steel industry, and titanite, an aluminum-manganese-titanium alloy that takes a high, corrosion-resistant polish.

The successful method of producing ductile titanium by the Bureau of Mines was described at a meeting of the American Institute of Mining and Metallurgical Engineers by R. S. Dean, assistant director of the Bureau, and J. R. Long, F. S. Wartman and E. L. Anderson, metallurgists or chemists of the Bureau.

The method involves reduction of titanium tetrachloride by a more active metal and yields titanium in a granular or powdered form. It follows in general what is known as the Kroll process. The active metal used is magnesium, and the reaction is carried out at a temperature of about 800 degrees Centigrade.

The reaction mixture, they state, consists of titanium, magnesium chloride, and unreacted magnesium. After cooling it is crushed and leached. The resulting granular titanium is ground wet, re-leached to remove the magnesium, dried, and consolidated by powder methods or by a special arc process.

The titanium powder produced was compacted into small pellets at a pressure of 100 tons per square inch and heat-treated or sintered at 1000 degrees

Centigrade in a high vacuum. After this treatment the compacts were usually malleable enough to withstand considerable cold deformation.

In an expansion of the process, great enough to produce 15 pounds of titanium in a single batch, various changes in apparatus and techniques were found both necessary and desirable. One of these, Mr. Dean said, was the use of an unlined iron pot instead of the molybdenum-lined pot initially used. Several methods of grinding the titanium were tried. One was in a small hammer mill operating in an atmosphere of helium to prevent oxidation of the titanium particles. A wet grinding process, with frequent screening to remove undersize particles, was finally used.

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GENERAL SCIENCE

Dispute Is Delaying Peacetime Atomic Energy

► **PEACEFUL** development of atomic energy is being delayed by legislative disputes over its control, Dr. Vannevar Bush, president of the Carnegie Institution of Washington and director of the Office of Scientific Research and Development, charged in a press conference.

Terming the delay unfortunate, Dr. Bush, who was a leading figure in the development of the atomic bomb, declared that a civilian control commission for atomic energy should be established with "plenty of authority."

Asserting that there is general agreement that control of atomic energy should be civilian, he said the question of military men serving on the commission was not a fundamental problem.

"We should make it clear from the outset that we want civilian control," Dr. Bush said, adding, "the military must have an interest in atomic energy, but not control."

Urging a commission made up of the most able men possible, he advocated that the group should have full discretion to decide what details of atomic energy should be released to the public and how far industry could go in its use.



SAVES TIME—Gaping metal jaws frame the 2500 horsepower Wright engine of the Lockheed Constellation as a mechanic makes a minor adjustment. Ground crews who have worked with the new type cowling say that as much as 15 to 20 minutes is saved every time an engine must be serviced or inspected. This saving in time will be passed on to Constellation airline passengers in reduced ground time during scheduled flights.

He denied that rigid government control would retard private developments and cited the regulation of narcotics manufacture and distribution as an example of private enterprise working under stiff government rule.

Dr. Bush said the Office of Scientific Research and Development is "still carrying on a small bit of research," and he hoped that this could be carried on by the proposed National Research Foundation which he favors.

The proximity fuze rather than the atomic bomb received Dr. Bush's nomination as the wartime weapon that "took more resource and courage than any other scientific development."

Describing the problems of producing the fuze as a radio station that could be fired from guns and turned out by the millions, he praised the scientific work on the fuze as a job that did the impossible.

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ORDNANCE

Counter-Attack Rockets

May be defense against attack by jet-propelled missiles. Army to seek protective methods in experiments with German V-2's this summer.

► "COUNTER-ATTACK" rockets sent up to explode enemy jet-propelled missiles harmlessly in mid-air may be the answer to the problem of a defense against attacks from the sky in a future war, believe Army experts who will conduct tests of captured German V-2 weapons at the White Sands, N. Mex., proving grounds this summer.

Every known method of radar detection, including the now-famous "moon-radar" equipment, will be used to plot the course of the captured rockets as they are sent streaming into the sky during the tests. From these experiments, the Army hopes to develop methods of defense against jet-propelled attacks.

If radar devices can successfully chart the course of the 3,000 miles-per-hour missiles, the Army's experts say that it should be possible to explode enemy rockets in mid-air by a radar-controlled "counter-attack" rocket. With radar charting the course of a missile as it heads toward the country, they say that it may be possible to send rockets into the arc of flight of the enemy weapon to explode it high in the air.

The tests this summer will be conducted on a course 150 miles long and 50 miles wide with the Ordnance, Air Forces and Signal Corps of the Army

cooperating in the experiments. Officers and civilians from Air Technical Service Command laboratories and veterans from the European occupational air force will man radar devices for the AAF, while Army Ordnance experts fire the Nazi rockets.

"A means must be found to defend our country against a sudden enemy rocket attack," Brig. Gen. William L. Richardson, chief of the guided missiles division of the Air Staff, said.

"We want to develop a method whereby we can intercept enemy rockets in mid-air. We cannot hope to do this, however, until we discover a method of tracing their course through the sky and predetermining their arc of flight.

"Once we accomplish this," declares Gen. Richardson, "it will be possible to design a 'counter-attack' rocket which will be controlled by radar and will be capable of intercepting the enemy rocket at a predetermined point in its course."

Gen. Richardson said that the AAF has been working on a defense against rockets since the first German V-2 landed accidentally in Sweden in the autumn of 1943, and he pointed out that offensive as well as defensive developments are expected from the tests with the Nazi missiles.

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ENGINEERING

Index to Nazi Struggle

Germany's locomotives are indicative of her struggle during the war to save materials, cost and labor. 1,000 parts eliminated, 30 tons in weight saved.

► GERMAN WARTIME locomotives exhibited by the Army Transportation Corps Board are an index to Germany's struggle during the war to meet transportation needs and at the same time save cost, critical material and labor. In one, built in 1942, drop forgings were used, materially reducing its cost. In this model the designers eliminated a thousand component parts from the German Series "50" locomotives which it replaced. Builders of this so-called standard-

type class "52" locomotive, for freight service, saved approximately 30 tons of materials required in the "50" locomotive, and eliminated 6,000 manhours of labor. In addition to the parts eliminated, 3,000 other parts were modified or altered in its design over the series "50" locomotive.

Another locomotive, built in 1944, embraces all savings in manhours and materials known in the production of the series "52" locomotive and in addition

corrects the faults of that engine. It appears to have the best thermal efficiency of the German war-built locomotives.

A third, built in August, 1944, is a type 2-10-0 steam engine with a condenser arrangement embodied in the tender. Several claims were made for its performance, one of 12,000 miles without water replenishment. The better figure, and that supported by greater authority, is 700 miles, according to Army officers.

A diesel switch engine with interesting features was also exhibited, as well as an eight-cylinder axle-drive steam locomotive, built in 1941 and designed for high-speed passenger service. Interesting also is a narrow-gauge steam locomotive built for the German Army for use on the Eastern front where much of the track gauge is 29½ inches or 750 millimeters.

The exhibit displayed at the Norfolk Army Base included also many items of captured German marine and other equipment including diesel engines for submarines, minesweepers, naval vessels, dirigibles and vehicles. The development of the diesel for dirigibles was instituted at the request of the Zeppelin Works, and its weight and size were kept within the limits of the corresponding gasoline engines. It is a V-type supercharged four-stroke cycle marine diesel, with individual cylinders of welded steel, and a crankcase of aluminum alloy. It was used on German "E" boats.

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ENGINEERING

Captive "Torpedo" Hunts Acoustic Mines

► A WARTIME invention still useful in clearing away some of the deadly remainders of war is covered by patent 2,395,862, issued to two government-employed civilians, H. B. Freeman and B. A. Wiener, both of Washington, D. C. It is a device for finding and exploding acoustic mines, many of which are still lurking in the world's seaways.

The device consists of a torpedo-shaped body, to be towed under water by a mine-sweeper. A propeller at the stern rotates a shaft within, on which are mounted a pair of flexible arms with metal balls on their ends. These strike rapidly against projections from the inner wall, producing a drumming or humming sound that is a good enough imitation of a ship's noise to set off acoustic mines.

The inventors have assigned their patent rights, royalty-free to the government.

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PUBLIC HEALTH

Syphilis Is Long Fight

The idea of wiping out this disease in one generation is called a "pipe dream", even with penicillin. Control of gonorrhea is more hopeful.

► "PENICILLIN has proved a tremendous boon to both patients and physicians in the treatment of all stages of syphilis," Dr. Evan W. Thomas, of New York University College of Medicine, declared at the meeting of the New York Tuberculosis and Health Association.

He warned, however, that in spite of penicillin or any new treatment that may be discovered, syphilis is not likely to be controlled through treatment alone.

"It is becoming more evident every day," he declared, "that the dream of eradicating syphilis in a generation is a pipe dream and little more than a pious hope, if we are dependent entirely upon effective methods of therapy alone."

"No disease yet has been controlled entirely by treatment," he pointed out, "and syphilis is far more complex and difficult to eradicate than most infectious diseases."

"Both the psychological and social factors which favor promiscuity and poor sexual hygiene require further investigation if we are to get at the roots of the spread of syphilis."

He urged fighting promiscuity with education and reasoned arguments and also urged giving the lay public continuous access to the best existing knowledge about syphilis.

A more hopeful view on control of another venereal disease, gonorrhea, was taken by Dr. Alfred Cohn, chief of the division of venereal disease research of the New York City Department of Health. Citing a cure rate of 98% with one type of penicillin treatment, and comparing various methods of using penicillin to treat gonorrhea, Dr. Cohn said:

"From the aforementioned data we may conclude that penicillin is an effective weapon for the control of gonococcal infections which when adequately and wisely used will help us to eradicate one of the great scourges of human-kind."

Penicillin does not have any beneficial effects in another venereal disease, lymphogranuloma venereum, sometimes known as tropical bubo, nor in granuloma inguinale, Dr. Borris A. Kornblith, of Gouverneur Hospital in New York, stated.

Current methods of treating the first of these diseases include sulfa drugs, Frei's antigen and in some cases surgery.

For granuloma inguinale, which is increasing in the southern United States, especially in the coastal areas, antimony drugs are used, sometimes with surgery. About one-fifth of the cases are not cleared up by antimony treatment and the sores remain open and infectious, which creates a serious public health problem.

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OCEANOGRAPHY

Seaweed Products Important in Industry

► SEAWEED gathering and processing is becoming an important American industry. It was stimulated during the war by shortages of seaweed products formerly obtained from Japan and other countries. The most-felt shortage was for one seaweed product, agar, used ex-

tensively by scientists in preparing solid bacteriological culture media, also in bakery products, medicines, health foods, and dental impression materials.

How World War II stimulated interest among some of the United Nations in developing greater seaweed resources was reviewed recently by Dr. C. K. Tseng of the Scripps Institution of Oceanography. In 1940, he said, the United States had a single agar factory which produced 24,000 pounds annually; now there are four with a combined output of 200,000 pounds each year.

Another important derivative from seaweed, he said, is algin, which is used as an ice cream stabilizer. Dairy experts regard it as equal to gelatin for this purpose. Four American companies are making algin, and from 2,000,000 to 3,000,000 pounds of alginous products are produced annually.

A third important seaweed product, he continued, is carrageen, or Irish moss extract, now the standard suspending agent for cocoa particles in chocolate-milk preparations. Three companies are producing some 500,000 pounds of the extract annually, and others are processing carrageen.

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ANTIQUE CHARM BRACELETS—Ancient Persians around 1300 B. C. used bangle bracelets and necklaces, according to Richard A. Martin, curator of Near Eastern Archaeology of the Chicago Natural History Museum. Most of the charms are miniature horses, dogs, frogs, goats, animal heads, pots and human hands and feet—as odd and unrelated an assortment as young girls wear today. The picture of "costume jewelry" recently acquired by the museum shows some of the objects worn in ancient Persia as compared with a bangle bracelet (center) popular today.

MEDICINE

Fatality in Appendicitis Greatly Decreased

► THE NUMBER of people dying from appendicitis in the United States dropped about two-fifths within the short space of three years. Between 1940 and 1943, the latest year for which data are available, the number of deaths due to this disease decreased from 9.9 to 6.1 per 100,000, a Metropolitan Life Insurance Company report shows.

A little more than a decade ago, 18,000 died each year from appendicitis. By 1943, however, the number of deaths in a much larger population had been cut to 8,100. The magnitude of this feat is realized when we consider that if the appendicitis death rate of the early 1930's prevailed today, the disease would now take about 20,000 lives a year.

The greatest improvement was experienced in Rhode Island and Maine, each of which shows a reduction of 62% in the three-year period. Although other states in the Mountain and Pacific region showed a larger relative decline than did the country as a whole, Nevada recorded a drop of only 19%. The smallest gains in reducing the mortality from appendicitis was made by the southern states, but even in this area no state recorded a reduction of less than 27% between 1940 and 1943.

The use of chemotherapy in cases complicated by peritonitis is undoubtedly responsible in large measure for this change, the report states. Part of the credit also belongs to the national educational campaign which effectively warned the public against delay in seeking medical advice and against the use of laxatives in case of abdominal pain, they state.

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PHYSICS

Baruch Will Fight for Atomic Energy Use

► WHEN Bernard M. Baruch, a grand old troubleshooter of two generations and two wars, takes his place as the American member of the UNO commission on atomic energy he will be fighting for the peaceful use of one of the most powerful sources of radiation, as well as the peaceful use of science's most powerful discovery, atomic energy.

A part of his personal fortune has been presented by Mr. Baruch to the American people as a foundation for physical medicine, meaning the application of powerful radiations, as well as sunshine,

heat, baths, etc., to the curing of human ills.

So as the man, known for his sitting in the sunshine on a Washington park bench, struggles as our representative in controlling atomic energy for the world, he will be motivated by a deep-seated desire to help humanity by controlling for good the radiation that is more powerful than anything this side of the stars, even more powerful than radium.

The equivalent of tons of radium has been going unused and wasted during plutonium manufacture while the military have kept the atomic energy results under a cloak of secrecy. An array of new atomic bomb by-products, if used in research, may allow our medical men to understand more closely the nature of cancer, heart disease and a host of other human ills.

His main job will be aiding the control of human emotions and actions so that atomic energy will not be loosed upon the world with destructive intent. And as he fights this battle for peace, he and his medical advisers will undoubtedly be doing what they can to extract from the clutches of secrecy the new tools of medicine that have come out of the atom.

Science News Letter, March 30, 1946

PSYCHOLOGY

Work for Older People Is Vitrally Necessary

► JOBS SUITED to their abilities rather than public financial help is the answer to the problems of older people, believes Dr. George Lawton, director of the Old Age Counselling Center in New York.

Declaring "America cannot demobilize old age," Dr. Lawton discussed the problems of aging as a guest of Watson Davis, director of Science Service, on "Adventures in Science," heard over the network of the Columbia Broadcasting System.

Even with greater old age assistance and social security benefits, the New York psychologist reported, "the normal older person given the choice between a congenial job and an income, whether as a federal grant or on a retirement pension, would prefer to keep on working as long as physically able."

"While there is no systematic research to prove that people who work longer live longer," Dr. Lawton said, "psychological and medical men on the basis of their clinical observation believe that of two men equal in all other respects, the one who keeps on working at a job he likes and can handle, will live longer than the one that retires."

Science News Letter, March 30, 1946

IN SCIENCE

DENTISTRY

Prevention of Tooth Decay May Come from Penicillin

► WILL PENICILLIN prevent tooth decay if you scrub your teeth with it?

An answer to that question will be sought this summer in a wholesale test with human guinea pigs, by Dr. Thomas J. Hill of Western Reserve University. The test will be made on 1,000 boys in an Eastern industrial school, beginning about July 1 and continuing for a year or more. Half of the boys will use tooth powder with penicillin added, the others will use a penicillin-less powder. At the end of the period the comparative numbers of cavities in the two groups should provide a definite yes-or-no answer.

Dr. Hill was stimulated to undertake this large-scale test by apparently significant results with smaller groups. Mouths in which the penicillin powder was used daily for several months were found to be practically free from the normally swarming populations of bacteria, including an acid-favoring species or group held to be a contributing factor in tooth decay.

Science News Letter, March 30, 1946

MEDICINE

BAL Drug Successful For Treating Poisoning

► THE DRUG, BAL (British antilewisite) will soon be released by the Food and Drug Administration for general distribution, Maj. Alfred Gilman of the Chemical Warfare Service has revealed. This chemical warfare material has been saving the lives of patients in Baltimore who took bichloride of mercury either by accident or with suicidal intent.

The police in Baltimore have by special arrangement been sending all such cases to the Johns Hopkins Hospital where Dr. Warfield T. Longcope and Dr. John A. Luetscher have treated 26 patients with good results.

Some recovered so rapidly under treatment with this amazing chemical that they walked out of the hospital within three or four days after taking a fatal dose of bichloride.

Science News Letter, March 30, 1946

SCIENCE FIELDS

GENERAL SCIENCE

Four Science Service Writers Receive Awards

► FOUR SCIENCE Service editors are included in the 13 pioneer science writers who received at St. Louis the first presentations of the George Westinghouse Science Writing Awards of the American Association for the Advancement of Science.

The writers for Science Service being thus honored are: Watson Davis, Frank Thone, Jane Stafford and Marjorie Van de Water.

Watson Davis is director of Science Service and inaugurated its newspaper service in 1921. Dr. Frank Thone is editor in biology and has been on the staff since 1924. Miss Jane Stafford has been medical editor since 1928 and Miss Marjorie Van de Water, psychology editor, has been on the staff since 1929.

Science Service has ten science editors, the largest science news staff of any press association.

Other science writers to receive the award are: Howard W. Blakeslee, Associated Press; David Dietz, Scripps-Howard Newspapers; Thomas R. Henry, *Washington Star*; Waldemar Kaempffert, *New York Times*; Gobind Behari Lal, *American Weekly*; William L. Laurence, *New York Times*; Herbert B. Nichols, *Christian Science Monitor*; John J. O'Neill, *New York Herald Tribune*; Robert D. Potter, *American Weekly*.

Science News Letter, March 30, 1946

METEOROLOGY

Structure of Meteorites May Be Clue to Their Past

► INTERNAL structure of iron meteorites may give clues to the past life of these visitors from space that crash into the earth's atmosphere, state E. P. Henderson and S. H. Perry of the U. S. National Museum.

Although many more stone than iron meteorites have been seen to fall as shooting stars, more irons are on exhibit in museums because they are the more easily identified. Iron meteorites are composed chiefly of iron and nickel, with small amounts of cobalt, phosphorus, sulfur and other elements.

After intensively studying an iron meteorite found a few years ago in Ohio,

Mr. Henderson and Mr. Perry believe that when iron meteorites of almost identical composition differ in structure, it is a sign that the conditions through which they have passed are quite different. Heat, together with the length of time the mass remains at a high temperature, is probably responsible for this.

The iron-nickel alloy known as taenite occurs in most iron meteorites. It is rarely possible to separate pure taenite in sufficient quantities to analyze it, but the structure of the New Westville iron permitted the mechanical separation of enough for analysis. Taenite varies in chemical composition, and it is believed that the higher the percentage of nickel contained, the lower the temperature at which the taenite was formed. The taenite in the New Westville iron contained 26.13% nickel.

Working out the complete history of a meteorite from the study of its internal patterns is not simple. The two scientists plan to continue their present investigations until many meteorites have been analyzed and metallographically studied, then heat-treat these specimens under controlled conditions to determine what significant changes take place. Eventually they hope that the internal structure may be understood sufficiently to give a brief autobiography of each meteorite.

Science News Letter, March 30, 1946

AERONAUTICS

Wartime Aircraft Secrets May Be Discussed

► WARTIME SECRETS in aircraft engineering are expected to be discussed at the National Aeronautic meeting of the Society of Automotive Engineers to be held April 3 to 5 in New York. Aeronautical engineers will have their first opportunity since the war for unrestricted technical review of wartime developments in commercial, military and private flying.

An opportunity will be given the engineers, also, to inspect certain German achievements in aviation with equipment on display loaned by the U. S. Army and Navy. They may see, in addition, the operation of Fido, the fog dispersal operation which enabled Allied warplanes to operate from British bases in Europe's thickest weather. American aircraft powerplants will be on display, particularly the General Electric I-40 jet propulsion engine. The engineers will inspect airline maintenance engineering and operation at LaGuardia Field and make airline flights over other airports.

Science News Letter, March 30, 1946

METALLURGY

Circular Home of Light Metal Under Production

► A CIRCULAR home of aluminum, with side walls and partitions suspended from a concealed central steel mast, has been displayed in model form. It is a Fuller house, developed from the original "Dymaxion" design by R. Buckminster Fuller in 1929. Its construction and use are now claimed to be practical because of the developments in light metals during the war and the use of techniques in mass-production that came with the construction of giant airplanes. It will be produced by the Beech Aircraft Corporation of Wichita, Kans.

This new Dymaxion is constructed of aluminum, stainless steel, and plastic. It has 1017 square feet of floor space and includes a combined living and dining room, two bedrooms, completely equipped kitchen, two complete bathrooms, and an entrance hall. A heating and air-conditioning equipment comes with the house. The price, erected and ready for use, is \$6,500.

This \$6,500 price includes the kitchen equipment in which is a cooking range, refrigerator, dishwasher, sink, washing machine and drier, and a waste disposal unit. With its ventilating system the inside air can be changed in six minutes. The exterior requires no painting. The building can withstand 180-mile hurricanes.

The house weighs only four tons, one-tenth the weight of conventional frame houses. In the condition in which it is shipped from the factory, it can be erected on its foundation, after it reaches its site, in two days by an eight-man crew.

Science News Letter, March 30, 1946

ENGINEERING

Lamme Medal Awarded David C. Prince

► THE 1945 LAMME medal of the American Institute of Electrical Engineers will be presented at the summer session of the Institute in Detroit, June 24, to David C. Prince of the General Electric Company, it is announced at the headquarters of the Institute.

The award to Mr. Prince is made for his distinguished work in the development of high-voltage switching equipment and electronic converters. The medal is an annual award established through a bequest of Benjamin Garver Lamme, who for 21 years before his death in 1924 was chief engineer of the Westinghouse Electric Corporation.

Science News Letter, March 30, 1946

ASTRONOMY

Four Planets Now Visible

Venus, Saturn, Mars and Jupiter appear in April evening skies. Easter is on April 21, the latest that it comes between 1943 and 1957.

By JAMES STOKLEY

► AFTER making its debut in the 1946 evening sky in March, Venus has now drawn still farther from the sun. It sets later, so at the time of sunset it is now about 15 degrees above the horizon. This is roughly the span of the hand when held at arm's length. Thus Venus, which is of magnitude minus 3.3, more brilliant than any other star or planet, is easily seen in the early evening. However, it sets before the times for which the accompanying maps are prepared—namely, for 10:00 p. m. at the first of April and 9:00 p. m. in the middle of the month.

On the maps, however, there are shown three of the five planets that ever can be seen with the naked eye. Of these the most brilliant is Jupiter, in the constellation of Virgo, the virgin, toward the southeast. The planet is close to the star Spica, which is classed as first magnitude, 1.2 on the astronomical scale of brightness. Jupiter's magnitude is minus 2, which means that it is about 19 times as bright.

The other two, Mars and Saturn, are in the constellation of Gemini, the twins, where they have been performing an interesting dance in recent months, practically forming a new constellation with the bright stars of that group, Castor and Pollux. Saturn, magnitude 0.3, is a little below Pollux, brighter of the twins. Mars is to the left, red in color, and about the middle of April is in line with Castor and Pollux, making the twins temporarily triplets.

Brightest Star

Sirius, the dog-star, in the constellation of Canis Major, the greater dog, is the brightest star now seen, and it stands low in the southwest. Above it is Procyon in Canis Minor, the lesser dog. Leo, the lion, is high in the south, and part of this constellation, toward the west, is called the "sickle," with bright Regulus at the end of the handle.

High in the north is Ursa Major, the great bear, with the great dipper, upside down. In this figure are the two stars called the pointers, which indicate the pole star below. The handle of the big

dipper points to the east, and if its curve is continued, it leads to first magnitude Arcturus, in Bootes, the bear driver.

In the northwest, below Castor, is Auriga, the charioteer, with Capella. Below Auriga is Taurus, the bull, with ruddy Aldebaran near the horizon. Though it was one of the brilliant orbs of the winter evening sky, it is now so low that it has lost much of its glory.

Lacking clocks and calendars, early man had to use recurring natural effects to mark time. The alternation of day and night provided the most obvious and fundamental unit—the day—while the parade of the seasons, with the sun high in the noonday sky at one period, and low in another, gave a longer measure—the year. But there was a need for an intermediate unit, and this was given by something that goes on in the nighttime sky, namely, the changing phases of the moon, which first appears in the west just after sunset as a narrow crescent, then gets bigger and bigger, night after night, until full moon is reached, and then wanes until it is last seen as a crescent in the east just before sunrise. A couple of days later the evening crescent reappears, and the cycle begins again.

This marked the month, the name of which is derived from the moon, while the name of that body goes back to the ancient Sanskrit in which the moon was called "mas." That was derived from the Sanskrit verb "mati," meaning "it measures," indicating how early it was used for an indicator of time.

In many early calendars the month began with the first appearance of the

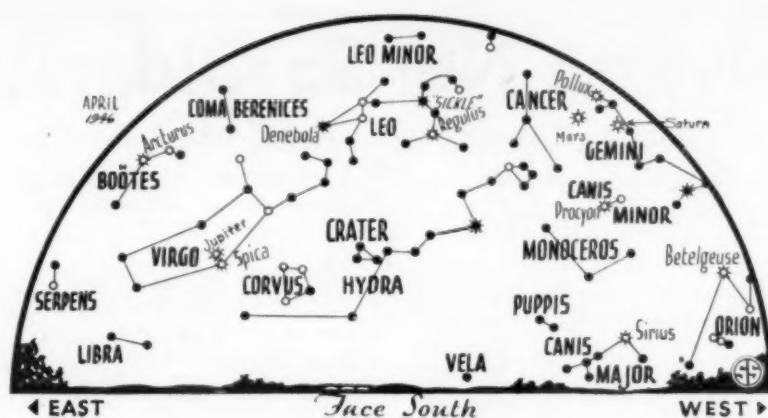
crescent moon in the western sky. This was true of the Hebrew calendar, and it was the duty of the priests to watch and announce it to their people by blowing a horn. Since the time between return of the same phase of the moon is 29½ days, they alternated the lengths of their months between 29 and 30 days.

The first month in the old ecclesiastical calendar of the Jews is the month of Nisan, which starts with the new moon occurring about the time of the vernal equinox, the beginning of spring. The 14th of Nisan is the beginning of the holy season of the Passover, commemorating the sparing of the Hebrews in Egypt when God, smiting the first born of the Egyptians, passed over the houses of the Jews, which were marked with the blood of the lamb.

Passover and Easter

It was about this time, in the Jewish calendar, that Christ was crucified, and the Last Supper, which he ate with the disciples the day before the Crucifixion, was the Passover feast. Consequently, the Jewish Passover and the Christian celebration of Easter are closely connected. The rule for the determination of the latter was set in 325 A. D. by the Council of Nicaea. Passover, of course, comes at the full moon since it is 14 days after the start of the month of Nisan, and it may come on any day of the week. The Council, however, decided that Easter should always come on a Sunday, the one following the Paschal (or Passover) full moon, which in turn was the first full moon after the vernal equinox. But they wanted to keep Easter and Passover forever separate, so they decided that when the full moon, and Passover itself, came on a Sunday, the following Sunday should be Easter.





◊ * • • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

Now let us see how this works out this year. The vernal equinox came on March 21, only four days after a full moon. That puts off the Paschal full moon to April 16, when Passover begins, but that is a Tuesday, so Easter does not come until Sunday, April 21. This is an unusually late Easter, the latest between 1943 and 1957. Only 10 times in the twentieth century does it come as late. However, Easter can come, as it did in 1943, as late as April 25. To do this, there must be a full moon on the 20th, the day before the equinox, and that day must be a Saturday. This postpones the Paschal full moon until Sunday, April 18, making the following Sunday, April 25, that of Easter.

The earliest that Easter can come is March 22. This happens when the full moon comes on the 21st and that day is Saturday. It occurred last in 1818, and will not be repeated at all in the twentieth century. In 1845, 1856 and 1913 Easter came on March 23, but it will not occur again as early as that in this century. Easter in 1940 was March 24, but even that will not be repeated before the twenty-first century. In 1951, however, it will come on March 25.

Thus, there is a variation in the date of Easter of 35 days. Many other activities in the church, as well as in secular life, depend on it and vary as well. For this reason there has been a movement for fixing Easter. There seems to be no religious objection to doing this. As a matter of fact, Christmas once varied in a similar manner, and was fixed in the fourth century.

The second Sunday in April has been suggested as the best date for Easter. It is close to April 9, accepted as the date of the Resurrection (in the year 30 A. D.). In 1928 the British Parliament passed a law fixing Easter on the first

Sunday after the second Saturday in April, to take effect when other nations agreed to do the same. The League of Nations had a committee studying the problem. Perhaps, when they have settled matters of more immediate importance, the UNO will get around to this, and then Easter may stop its centuries of wandering.

Celestial Time Table for April

April	EST	
1	11:37 p.m.	New moon
2	11:01 p.m.	Moon passes Venus
3	5:00 p.m.	Moon nearest, distance 224,600 miles
8	2:26 p.m.	Moon passes Saturn
9	3:04 p.m.	Moon in first quarter
9	1:39 a.m.	Moon passes Mars
12	7:00 p.m.	Jupiter opposite sun and nearest earth, distance 413,500,000 miles
15	8:05 p.m.	Moon passes Jupiter
16	5:47 a.m.	Full moon
19	8:00 a.m.	Moon farthest, distance 252,100 miles
21	early a.m.	Meteors of Lyrid shower visible
23	4:00 a.m.	Mercury farthest west of sun, in morning sky before sunrise
24	10:18 a.m.	Moon in last quarter

Subtract one hour for CST, two hours for MST, and three for PST.

Science News Letter, March 30, 1946

NUTRITION

Quick Cooking Saves Vitamin Content

► QUICK COOKING methods not only save time for the cook but also save vitamins for her and her family's health.

Consider potatoes, for example. Nutritionists have long advised cooking them in their jackets, to save vitamins. Now scientists of the U. S. Bureau of Human Nutrition and Home Economics say that boiling potatoes in their skins is a better method even than baking them, so far as retaining vitamins is concerned.

Their pronouncement is based on tests with common foods cooked by home methods. Potatoes baked in their skins,

these tests showed, lost as much as 80% of their original vitamin C and 50% of their thiamin or vitamin B₁. When potatoes were boiled in their skins, however, the vitamin C loss was only 40% and the loss of thiamin 15% to 20%. In other words, baked potatoes lose twice as much vitamin C and three times as much thiamin as potatoes boiled in their skins.

Oatmeal is another food the government scientists tested to see how cooking would affect its vitamin content. This food is a good source of thiamin and the tests showed that when cooked directly over the flame for two and one-half minutes the thiamin loss is small. When the oatmeal is cooked for 30 minutes in a double boiler, however, the thiamin loss is 30%, or 15 times as great.

The vitamin A value of yellow cornmeal cooked by these two methods, on the other hand, appears to be the same, the tests showed. This vitamin is present in plants or plant foods in the form of carotene, a chemical which the body converts into the vitamin. Carotene is, in general, relatively stable during cooking.

Science News Letter, March 30, 1946

ENTOMOLOGY

British Insecticide Controls Boll Weevil

► THE COTTON boll weevil, probably the most damaging pest to the American cotton crop, may completely succumb to a new British insecticide, benzene hexachloride, which American field tests indicate is more effective, as far as cotton insects are concerned, than DDT or the old stand-by, calcium arsenate. The new material killed also more cotton leafworms, plant bugs, cotton fleahoppers, and cotton aphids than the standard insecticides.

Benzene hexachloride, as a cotton insecticide, apparently has one weakness, scientists of the U. S. Department of Agriculture who made the tests state. It is not as effective as calcium arsenate or DDT for the control of bollworms. However, it has no ill effects on cotton plants when used in low dosages.

The new material will not be available during the coming cotton season for general application, but is now being made in the United States in sufficient quantities to continue experimentation. If tests to be made this summer are as satisfactory as expected, and serious shortcomings do not come to light, it will probably become available to cotton growers within a relatively short time.

Science News Letter, March 30, 1946

Do You Know?

With a standard *parachute* a man falls at about 14 miles an hour.

Big-game animals have increased in the United States during the recent years to over 7,000,000, or one to every 19 human beings in the nation.

Fish kept in cold storage for a long time unprotected from atmospheric oxygen deteriorates; the fat becomes rancid, darkening the flesh to a rust color.

Color blindness of the mild red-green type has been apparently cured by a course of treatment that includes vitamin A.

Mixing *penicillin* with ice cream makes possible its administration by mouth instead of through the usual hypodermic injection.

The contents of the Army insect-killing device known as the *aerosol bomb* included 3% DDT, 2% of a 20% pyrethrum concentrate, 5% cyclohexanone, 5% lubricating oil, and 85% Freon gas as carrier.

Asparagus loses quality rapidly after harvesting as ordinarily handled; experiments are now being conducted to prevent deterioration by wrapping selected bunches in cellophane bags, icing immediately and keeping refrigerated.

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By Oscar L. Levin, M.D.
and Howard T. Behrman, M.D.

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ASTRONOMY

Universe Not So Old

Is now believed to be only slightly older than the earth. Studies of the Milky Way are the most direct evidence of new theory.

► THE UNIVERSE as a whole is now believed to be only slightly older than our own earth, Dr. Bart J. Bok of the Harvard Observatory told the nation's outstanding high-school-age scientists at a session of the Science Talent Institute.

Dr. Bok discussed modern advances in the study of astronomy at the Science Institute attended by the 40 winners of the Fifth Annual Science Talent Search, sponsored by Science Clubs of America and administered by Science Service.

Pointing out that astronomers of 25 years ago estimated the age of the universe at five trillion years, as opposed to a mere two or three billion years for the earth, the Harvard astronomer said that modern research has cut the estimated age of the universe to only slightly more than that of the earth.

Dr. Bok attributed the recent reduction in estimates of the age of the universe to photographic studies of the Milky Way, spectrum studies of the heaven's galaxies and developments in astronomic theory.

The most direct evidence that the universe is not much older than the earth is to be found in the studies of the Milky Way, said the astronomer.

Our Milky Way system is composed of many loosely-held-together clusters of stars, he explained. As the Milky Way is rotating rapidly about its central star clouds, the shearing effects resulting from the tidal pull of these central clouds would tend to disrupt loose aggregations of stars in a matter of a few galactic revolutions, he pointed out.

"We know of no way in which star clusters are still being formed at the present time," he said, adding that "The presence of several hundred clusters on our Milky Way photographs indicates, therefore, that our system has not been whirling around its axis for more than a relatively few galactic revolutions."

Time estimates, Dr. Bok continued, can be made from studying the spectrum lines of the more distant galaxies to determine how long ago all galaxies were together at the origin of the expansion. These studies place the age of the universe at from two to three billion years, he said.

The discovery of stars pouring out tremendous amounts of energy that indicate a more recent age has led to changes in the theory of astronomy that support the shorter time-scale for the universe, the astronomer said.

"Everywhere in the universe there are signs of youthful exuberance," declared Dr. Bok.

Science News Letter, March 30, 1946

ELECTRONICS

Velocity and Accuracy Tests Made Simultaneously

► HOW AN ELECTRICAL method developed by the War Department during the war to measure the velocity of projectiles is now in use by the Western Cartridge Company in East Alton, Ill., to make simultaneous accuracy and velocity tests with the same bullet is told in *Sports Afield*. Previously, separate bullets were required for each test.

The instrument used is called a counter chronograph. In making the dual velocity and accuracy tests, a rifle is fired from a mechanical rest. The bullet passes over photoelectric cells in two devices called light screens which are a measured distance apart, and are connected with the counter electrically. The shadow cast by the bullet as it passes over the first photocell starts the chronograph counting; its shadow over the second cell stops the counting. When used outdoors only daylight is required; within darkened shooting ranges tubular lights, under which the bullet passes, are used. The counter records the time required for the bullet to pass from one screen to the other. A target beyond records the bullet's accuracy.

The "brain" of the counter chronograph is a so-called electronic counting circuit which performs the breath-taking function of counting and recording 1/100,000-second time intervals. With an ingenious arrangement of tiny neon bulbs it records the count of electronic pulses that pour into the counter at a rate of 100,000 per second. With its four banks of light, it can count 9,999 pulses, the time measurement of about one-tenth of a second.

Science News Letter, March 30, 1946



Domesticated Flies

► FOR CENTURIES, the honeybee was the only insect that could be counted among man's domestic animals. To be sure, the bee was somewhat less domestic even than the goat: it would consent to live in quarters provided by man, and would yield up part of its product to him under rather drastic persuasion. But the fly remained wholly wild and free, living in man's houses as a tolerated pest, as rats and mice do.

Only when the fly finally became recognized as a disease-carrying pest that could no longer be tolerated did man take the trouble to domesticate it. Nowadays, in a considerable number of places, flies are solicitously reared on selected food in large, sanitary cages. Special care is given to insure maximum reproduction and growth to healthy maturity of the insects that emerge after pupation.

This procedure, which a couple of generations ago would have been regarded as sheer lunacy, is carried out in order to secure adequate stocks of flies on which to test the potency of insecticide sprays. When a new batch of spray is ready, a counted number of flies are released into a windowed test chamber. The spray is released under uniform pressure through standardized nozzles.

By tens and fifties the victims fall, while the entomologists coolly watch the slaughter through the window. After a stated time period they count the survivors. If these number more than a certain maximum percent, the batch of spray is rejected as too weak. If the "knockdown" number is high enough, and the eventual kill is also high, the spray receives the official OK.

This business of wholesale production of flies for the insecticide testing labora-

tories has been going on not quite a quarter-century. When the first domestic fly sprays were produced, back in the early '20's, the winged guinea pigs, needed to assay their deadliness, had to be captured in the wild—usually in the rear of livery stables that still survived at that time.

Soon, however, this haphazard source proved insufficient. It was inadequate qualitatively as well as quantitatively, for comparative tests showed that "wild" flies from the dungheap were not as strong and tough as those hand-raised on more carefully selected foods, and hence not as good test animals. Oddly enough, it was found that the best fly food is milk. Milk-fed flies are quite the opposite of tender; in Flydom, "milk-sop" means "toughie."

Science News Letter, March 30, 1946

CHEMISTRY

Vacuum Drying Produces Superior Foods

► VACUUM-DRYING of frozen fruits and vegetables may solve the problem of food preservation by the dehydration method and give products superior to those resulting from the ordinary hot-air dehydration used extensively during the war, which, it is claimed, do not retain satisfactorily full flavor, appearance and nutritive value. The "freeze-drying" process, still in an experimental stage, is similar to the successful method of preparing blood plasma, penicillin, vaccines and bacteriological cultures for preservation and shipment.

In this freeze-drying method the material to be dried is first frozen and then exposed to a high vacuum. Because the ice in the frozen material vaporizes without melting, the process is sometimes spoken of as drying by sublimation. It is not a new method. As far back as 1909, L. F. Shackell of the University of Missouri experimented with the preservation of perishable sera by drying under a vacuum. Its use in dehydrating fruits and vegetables, however, is new.

A preliminary report on the freeze-drying method of the dehydration of fruits and vegetables has been made by James C. Moyer and Elmer Stotz of the New York State Agricultural Experiment Station. They are careful to state that the procedure is still in an experimental stage.

"In the comparison of vegetables or fruits dried by sublimation and those dehydrated in the usual manner in a stream of warm air," they state, "the light, porous nature of the vacuum-dried ma-

terial provides a contrast to the shrunken and glassy or case-hardened outer surfaces of the heat-dried products. The open, porous texture of the vacuum-dried fruits or vegetables is responsible for their extremely rapid reconstitution when placed in only cold water."

Reconstituted vegetables, dehydrated by the freeze-drying process, are not tough, and have lost little flavor. The loss of ascorbic acid, or vitamin C, is only 2% to 10%, while in the warm-air process it is from 20% to 30%. Much research remains to be done, the two experimenters say, before fruits or vegetables can be readily preserved by this sublimation method, but the process will some day be commercially possible.

Science News Letter, March 30, 1946

Sumac is a valuable shrub to protect soil from erosion because it grows in rough places with poor soil; at the same time it can be a valuable cash crop because it yields a tanning material needed in leather-making.

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ARCHITECTURAL DRAWING AND DETAILING—J. Ralph Dalzell and James McKinney—*American Technical Soc.*, 212 p., diagrs. and tables, \$2.50, rev. ed. The general principles and techniques of architectural drawing, detailing, rendering in pen and ink, and landscaping.

THE AVIATION ANNUAL OF 1946—Reginald M. Cleveland and Frederick P. Graham, editors—*Doubleday*, 245 p., illus., \$4. A consideration of the present situation in aviation and a survey of the possibilities for travel, commerce and protection for peace in the air of tomorrow. Articles by General H. H. Arnold, Fleet Admiral Ernest J. King, Dr. George W. Lewis, and many others.

BRACHIOPODA OF THE INDEPENDENCE SHALE OF IOWA—Merrill A. Stainbrook—*Geological Soc. of America*, 74 p., illus., \$1. Geological Society of America, Memoir 14.

COLD STORAGE FOR APPLES AND PEARS—W. V. Hukill and Edwin Smith—*Dept. of Agric.*, 61 p., illus. and tables, 15 cents. The response of fruit to storage conditions, cold storage plants and equipment, and tables of the average freezing temperatures of fruits and other relevant data.

DR. MORTON: Pioneer in the Use of Ether—Rachel Baker—*Julian Messner*, 224 p., illus., \$2.50. The biography of a man who took as his mission the alleviation of pain.

DOCTORS, DRUGS AND STEEL—Edward Podolsky, M.D.—*Ackerman*, 384 p., illus., \$3.75. The story of penicillin, the sulfa

drugs, hormones, and other recent medical discoveries destined to lengthen man's life span.

ELEMENTARY APPLIED AERODYNAMICS—Paul E. Hemke—*Prentice-Hall*, 231 p., diagrs. and tables, \$4.35. A textbook designed to meet the requirements of a first course in technical applied aerodynamics, and presupposing preliminary training in mathematics, physics and mechanics.

THE JOURNAL OF FREQUENCY MODULATION—Harold Becker, Managing Editor—*Telecasting Publications, Inc.*, Monthly, \$3 a year. First issue of a new Journal.

ONE WORLD OR NONE—Dexter Masters and Katharine Way, editors—*McGraw*, 79 p., diagrs., \$1. Reports to the public on the full meaning of the atomic bomb by Albert Einstein, Irving Langmuir, Harlow Shapley, Walter Lippmann, and others.

OUR WORLD CHANGES—Samuel Ralph Powers, Elsie Flint Neuner, Herbert Bascom Bruner, and John Hodgdon Bradley—*Ginn*, 584 p., illus. and tables, \$1.68, new edition. Studies in natural science for grades seven, eight, and nine.

PAINT MANUAL: With Particular Reference to Federal Specifications—Percy H. Walker and Eugene F. Hickson—*Dept. of Commerce*, 165 p., illus. and tables, \$1. An aid in procuring materials suitable and adequate for most kinds of painting. Methods are described for preparation of surfaces and the application of coatings.

PHYSICAL CONSTANTS OF HYDROCARBONS: Vol. 3, Mononuclear Aromatic Hydrocarbons—Gustav Egloff—*Reinhold*, 661 p., diagrs. and tables, \$15. American Chemical Society Monograph Series.

PSYCHOANALYTIC THERAPY: Principles and Application—Franz Alexander, M.D., and Thomas M. French, M.D., with Staff Members of the Institute of Psychoanalysis, Chicago—*Ronald Press*, 353 p., \$5. The results of an investigative work which represents a concerted effort to define those basic principles which make possible a more efficient means of psychotherapy and to develop specific techniques of treatment.

PSYCHOLOGY FOR NURSES: Designed and Written for Student Nurses—Bess V. Cunningham—*D. Appleton-Century*, 336 p., diagrs. and tables, \$3. An introduction to psychological principles which will help the nurse during the critical period of orientation and training as well as in her later professional contacts with associates and patients.

RUBBER IN ENGINEERING: Prepared under the direction of the Controller of Chemical Research of the Ministry of Supply and the Directors of Scientific Research of the Ministry of Aircraft Production and the Admiralty on the Basis of Research Carried out by the Imperial Chemical Industries, Ltd.—*Chemical Pub.*, 267 p., illus. and tables, \$5.50. A general survey of the information available on the fundamental properties of rubber.

SIMPLIFIED ARCHITECTURAL DRAWING: With Examples and Graded Problems—Truman C. Buss, Jr.—*American Technical Soc.*, 258 p., diagrs. and illus., \$4.75. A book to fill the gap between instruction pertaining to mechanical drawing and that pertaining to architectural design.

SPANISH TRAVEL-AIDE—Victoria Villagomez Macaulay, arranged and edited by George F. Cornwall—*Binfords & Mort*, 174 p., illus., \$1.50, rev. ed. A quick approach to the Spanish language; ready-made expressions with phonetics and English equivalents.

STEEL IN THE WAR—Douglas A. Fisher—*U. S. Steel Corp.*, 164 p., illus. and tables, free. The now-it-can-be-told story of an industrial accomplishment which contributed much to the victory of the United Nations in World War II.

TEXTBOOK OF OBSTETRICS: Designed for Use of Students and Practitioners—Henricus J. Stander, M.D.—*D. Appleton-Century*, 1277 p., illus. and diagrs., \$10, Stander's 3rd revision. This edition represents the ninth edition of WILLIAMS OBSTETRICS, the first six of which were written by the late Dr. J. Whitridge Williams.

WAR AND PEACE AIMS: Extracts from Statements of United Nations Leaders—*United Nations Information Office*, 176 p., 75 cents. Special Supplement No. 7 to the United Nations Review.

THE WHITEFISH FISHERY OF LAKES HURON AND MICHIGAN WITH SPECIAL REFERENCE TO THE DEEP-TRAP-NET FISHERY—John Van Oosten, Ralph Hile, and Frank Jobs—*Dept. of the Interior*, 394 p., diagrs. and tables, 35 cents. Fishery Bulletin 40.

Science News Letter, March 30, 1946

ASTRONOMY

International Astronomical Station Advocated

► CREATION of an international astronomical observatory and research station under UNO was advocated by astronomers of 13 nations, including Russia, Britain and the United States, meeting in Copenhagen for the first session of the International Astronomical Union's executive committee since the war.

The astronomical station would be a strong and many-sided research organization if the proposal introduced by Dr. Harlow Shapley, director of Harvard College Observatory, is brought to fruition.

Dr. Shapley proposed that the United Nations Educational, Scientific and Cultural Organization should consider implementing development of truly international institutes in special fields, such as public health, new foods, astronomy and atomic energy. He argued that scientists set the pattern for friendly active international cooperation.

We should do nothing nationally, he said, that it is possible to do as well or better internationally.

The Polish delegation advocated both North and South Polar International Observatories.



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The Soviet delegation reported plans for sending a group of leading Russian astronomers to America soon, preparatory to rebuilding Russian observatories destroyed by war. Dr. A. Mikhailov of Moscow was elected to the International Astronomical Union's Executive Committee. The other six members are from the United States, England, France, Holland, Italy, and Sweden.

The international astronomical bu-

reaus, suspended during the war, are being reestablished with much of the former German activities going to Russians.

The British astronomer royal, Spencer Jones, presided at the meetings, at which the American delegation consisted of Dr. Shapley, Dr. Otto Struve of Yerkes Observatory, and Dr. Joel Stebbins of Washburn Observatory.

Science News Letter, March 30, 1946

PSYCHOLOGY

"Lie Detector" Doesn't

Reportedly used at Oak Ridge to trap those stealing U-235 or telling atomic secrets, it is an instrument of third-degree, not scientific crime detection.

► THE SO-CALLED "lie detector," reportedly used to trap those stealing uranium 235 or selling atomic secrets, is an instrument of third-degree intimidation, not of scientific crime detection. Its evidence is not generally accepted in courts of law.

The "lie detector" does not detect lies. It only shows up the emotional excitement of the victim. This is done by measuring respiration, blood pressure and the electrical resistance of the skin.

When you are scared, or angry, or embarrassed, your heart beats faster, your breath is quickened and moisture is likely to break out on your forehead or the palms of your hands. And since the moisture of your perspiration changes the way in which your skin conducts an electric current, the "lie detector" tells your questioner all about your uncomfortable feelings. Although you may try to preserve a poker face, it is difficult to control heart rate and perspiration. So the questioners may literally "sweat it out" of the unhappy suspect.

Scientists do not rely on the evidence of the "lie detector," however, for the

obvious reason that not all persons frightened by third-degree questioning are liars or guilty of crime.

Any worker at Oak Ridge might very well be terrified at being accused of stealing U-235 in this day of spy scares. Or he might be violently angry at this accusation of dishonesty and traitorous behavior.

On the other hand, a psychopath or professional liar may feel no emotion at all at his own falsehoods and the "lie detector" would give such a person a perfect score for truth.

The instrument is not a product of the atomic age. Although it may have been modified during the years, the same sort of instrument has been known and in limited use for some twenty years or more. During that time it has not been established as generally useful.

Evidence obtained by the "lie detector" has never stood up in courts of law. In a few cases, it has been accepted by lower courts, but has not withstood appeal.

Chief usefulness of the gadget is as an aid to the police in scaring an ignorant or superstitious person into making a confession of crime. An empty black box, if it looks mysterious, would serve the same purpose—and has been used for it.

Science News Letter, March 30, 1946

ENGINEERING

Faster Production of Steel Sheets Contemplated

► FASTER production of the flat steel plates on which the automotive industry heavily depends is contemplated in a new

mechanical setup on which U. S. patent 2,397,029 has been issued to W. H. McLaughlin and G. H. Rendel of Gary, Ind., assignors to the Carnegie-Illinois Steel Corporation.

The big rolls of sheet metal, as they are delivered from the continuous-strip mill, are unreel first through two sets of rollers that stretch the web tightly, thus straightening it. Thence it goes through a trimming machine that crops its edges straight, then through another series of rollers that give it a final flattening. Finally a massive pair of shear blades cut it to the desired lengths.

Science News Letter, March 30, 1946

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•New Machines And Gadgets•

✿ **OPTICAL micrometer** measures the thickness in central sections of large sheets of glass or transparent plastics. It is a microscope focussed on a chalk-mark on the opposite side of the material, while its nosepiece rests on the front side. Micrometer readings on its barrel give the thickness.

Science News Letter, March 30, 1946

✿ **HEMISPHERICAL parachute**, that looks like half a baseball as it floats in the air, drops without the characteristic swaying or oscillation of the conventional type. It has a unique shock-absorbing hemispherical shape that enables it to withstand the opening impact when used with a load from a speedy plane.

Science News Letter, March 30, 1946

✿ **OVERFLOW STOPPER** for kitchen sinks permits surplus water to escape in a too-full sink. Waste coffee or other liquid may also be emptied into the waste pipe without removal of the stopper. It consists of an open upright tube with an annular rubber flange that holds the device in place by suction.

Science News Letter, March 30, 1946

✿ **TOY TOP**, made of transparent material and containing liquids of different color and density, changes color as the top spins and the liquids are mixed by centrifugal force. Vanes inside the recently patented top cause the liquid to rotate when spinning motion is initially given to the toy.

Science News Letter, March 30, 1946

✿ **DIRECT-READING compass**, developed for the armed services, is now available to civilians. It is a combination



compass and matchbox, as the picture shows. Its principal advantage is that the user, by looking through a small side window, can determine at a glance the direction he faces.

Science News Letter, March 30, 1946

✿ **ERASING attachment** for a typewriter, that erases without removing the copy from the machine, is operated by a special key on the keyboard. When the key is depressed, the eraser strikes the paper. It is a belt stretched over a tiny wheel which is mechanically operated by the impact blow.

Science News Letter, March 30, 1946

✿ **INCUBATORS** for infants are now made of transparent plastics with a clear top and sliding panels. The baby is always visible, and can be observed without disturbing him or the scientifically controlled humidity and temperature inside. When necessary he can be reached by sliding a panel.

Science News Letter, March 30, 1946

✿ **FIREFIGHTING plow**, to break the soil in front of forest fires, is an implement of the middle-buster or two-way type that plows a clear double 28-inch furrow. A set of wings and disks spreads the loosened soil to cover the vegetable litter on each side of the furrow.

Science News Letter, March 30, 1946

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington 6, D. C., and ask for Gadget Bulletin 304.

Science News Letter, March 30, 1946

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